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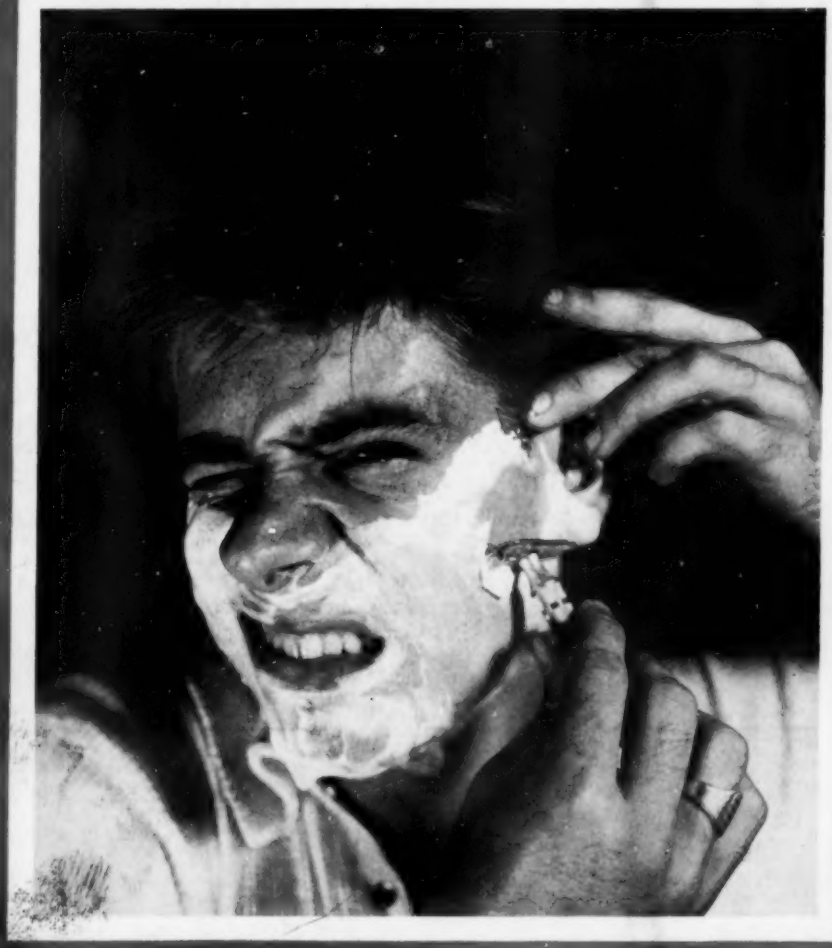
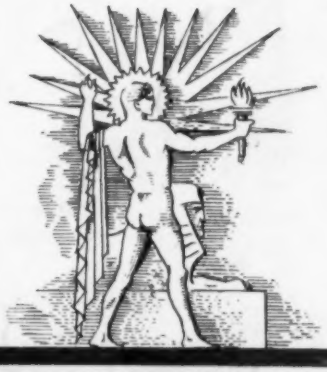
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





July 2, 1938

Suicidal

See Page 10

A SCIENCE SERVICE PUBLICATION

Do You Know?

The peacock was brought to Egypt by the Phoenicians.

Tin cans never reach the dump in one western city; they are dissolved with chemicals and the tin is eventually cast into ingots.

Most volcanic craters are formed by collapse of the volcano's peak, rather than by great explosions, says a volcanologist of the University of California.

A number of states now have food-plant nurseries, where they start trees and other plants that provide nuts, fruits, and berries for birds and animals to eat.

A psychologist says it is no wonder school children write "boners," since words in English have so many definitions: for example, "game" has 15 meanings, "grain" has 30, "fail" has 29, and "account" has 34.

There are two forms of rabies in dogs: the furious form, which leads a dog to fight or bite at anything interfering with its freedom; and the paralytic form, which paralyzes the lower jaw and then progressively the rest of the body.

Spanish padres built their missions at Indian villages, which explains the quaint half-Indian names of the old missions, such as Mission San Jose de Tumacacori—meaning the mission of St. Joseph at the place of many small fenced fields.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ASTRONOMY

Where is the largest known galaxy? p. 3.

AVIATION

Who has made a wooden airplane? p. 8.

BIOCHEMISTRY

Who is the first Isaac Adler prizeman? p. 9.

BOTANY

Are the dragon-trees of the Canary Islands really old? p. 13.
What tree's leaves are "already pressed"? p. 14.

CHEMISTRY

What new use has been found for lignin? p. 13.

ENGINEERING

Is the sleeve-valve engine dead? p. 12.

GEOGRAPHY

How much mud is there in Hwang-Ho water? p. 5.

GEOLOGY

How do gems indicate mountain ages? p. 9.

MEDICINE

Why is warm air recommended for sinus sufferers? p. 7.
What new remedy is used against meningitis? p. 8.
Does alcohol kill trichinae? p. 9.
How do large blood cells function in recovery from pneumonia? p. 9.

ORNITHOLOGY

What is meant by "water migration"? p. 9.

PALEONTOLOGY

Which came first, dinosaurs or snakes? p. 4.

PHOTOGRAPHY

How can blood corpuscles help photographers? p. 8.

PHYSICS

In what three ways can man capture energy from the sun? p. 15.

PHYSIOLOGY

Why do we grow old ? p. 6.
Is "blind drunk" ever a literally accurate phrase? p. 8.

PSYCHIATRY

How often have you committed partial suicide? p. 10.
What was "officers' disease"? p. 15.

PUBLIC HEALTH

Why can't recovered TB patients support themselves? p. 4.

An octopus in a fight literally turns red with rage.

Beautiful Yosemite Valley in California was an Indian stronghold until white settlers drove the red men out.

A midget portable device for collecting dust in the air has been designed by the Bureau of Mines, for use in war against breathing harmful dust in industry.

Birds reproduce themselves four to five times faster than mammals.

In the past four or five years some three million acres of land unsuited to agriculture have been added to the national system of waterfowl refuges.

Ancient Rome got silk from China, but so involved was the caravan system which brought the valued goods that neither Rome nor China knew of the other's existence.

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ASTRONOMY

Our Galaxy Biggest Known, 100,000 Light Years Across

New Method Gives Independent Confirmation of Estimate; Nearly Quarter-Billion Years Required for Rotation

WE ARE big town folks after all, astronomically speaking. The nebula or galaxy of which our sun is a not-too-prominent member is the biggest one astronomers know anything about. Most of the other nebulae are considerably smaller, though the famous spiral nebula in Andromeda is almost as big as our own, Dr. J. S. Plaskett, director of the Dominion Astrophysical Observatory at Victoria, B. C., stated in his address before the meeting of the American Association for the Advancement of Science, Pacific Division.

Ideas Have Expanded

Ideas of the size of our galaxy have grown with time. Dr. Plaskett told of the expansion of the estimates, from the estimate of Herschel in the late 18th century until today. Herschel considered the universe to be only 6,000 light years in diameter and 1,100 light years thick. Most recent estimates make it 100,000 light years across, with a thickness ranging from 5,000 to 10,000 light years.

This measurement, which was arrived at by analysis of the color of incoming light from the stars, has just been checked by Dr. Plaskett, who used a new method depending on the rate of rotation of the whole galaxy. His results, announced for the first time at the meeting, are in close agreement with the measurements as given.

Dr. Plaskett painted a word-picture of the galaxy:

"The main feature of the galaxy is the great flattened disc of stars and star clouds containing probably over 90 per cent. of the mass of the system. This disc of stars is about 100,000 light years in diameter, with a thickness of scarcely more than 5,000 light years near the boundary, which is practically circular in outline, and increasing to perhaps 10,000 light years near the center, where, from analogy with external systems there may be a spheroidal enlargement some 15,000 light years or more in thickness.

"While the star density rapidly decreases at these limits, there appear to be scattered stars extending perhaps to 15,000 light years beyond the periphery and a proportional amount above and below the central disc. This central disc of stars is surrounded and approximately outlined by the globular clusters, having a practically spherical distribution.

"There can be no reasonable doubt that the discoidal shape of our stellar system is produced and maintained by its rapid rotation in its own plane. The presence of this rotation has been so conclusively demonstrated from the motions of stars and other celestial objects in the system, and it seems such a universal property of external systems that it can no longer be doubted that the galaxy is in rotation in its own plane.

"The rotation is not like a solid body, where stars nearer the center would rotate more slowly than those farther out. On the contrary, the rotation is more like planetary motion, where the inner planets rotate much more rapidly than the outer ones. The rotational speed near the sun is about 275 kilometers (175 miles) a second, but so vast is the stellar system that it will take 220,000,000 years to complete one revolution.

One-Third Unorganized

"From the dynamical consequences of the rotation it is learned that the total mass of the system is 165,000,000,000 times that of the sun. As the number of stars probably present could not make up this mass, it appears likely that the deficiency in mass will be readily made up by the absorbing matter which a probable density and distribution would give at least one-third of the mass of the whole system.

"While the dimensions, structure and dynamical organization of the stellar system have been fairly definitely stated, the proposed model should only be considered as a preliminary attempt at the solution of this difficult yet very important astronomical problem. In view of the changes in viewpoint in the past 20 years, one would be very rash to predict that even approximate finality had been reached. It can only be hoped that the concept developed, which has a certain unity and completeness, may make a useful introduction to more complete knowledge," Dr. Plaskett concluded.

AS OTHERS SEE US

The Great Spiral in Andromeda, not quite so large as our own galaxy, but apparently very much like it in general shape and composition.

Desert Lake

Driest place in the United States now, the Mohave Desert once contained a great freshwater lake. And there is evidence that human beings lived on its shore terraces, for stone tools have been found there.

The history of lakes that are now deserts was told by Dr. Ernst Antevs, research associate of the Carnegie Institution of Washington.

Other vanished western lakes were Lake Lahontan in Nevada, and Lake Bonneville in Utah, of which the Great Salt Lake is a dwindled fragment. All these lakes existed during the closing stages of the pleistocene Ice Age.

After the glaciers had melted away from the northern part of the continent there ensued an exceedingly dry period, drier even than the climate of the West today, Dr. Antevs stated. This in turn was succeeded by a change for the better, which, according to geological evidence, came about 2,000 B. C. During this time several new lakes, including Owens Lake in California and Abert and Summer Lakes in Oregon, came into being.

Not only lakes but arroyos or deep, usually dry gullies, have been examined for evidences of climatic changes by Dr. Antevs. Arroyo formation in the modern West has come as a result of over-grazing by the white man's flocks and herds, he says. But there are arroyos pre-dating Columbus, and these, Dr. Antevs has

concluded, were due to prolonged droughts that killed the protecting cover of vegetation and permitted erosion for a time.

Water from the Black and Mediterranean seas, pouring out through the Strait of Gibraltar, spreads itself out through a large part of the Atlantic Ocean, Dr. H. U. Sverdrup, director of the Scripps Institution of Oceanography, stated.

The water from the Mediterranean, easily detected because it is saltier than ocean water, is found at levels between 4,000 and 6,000 feet below the surface, said Dr. Sverdrup. It spreads out through the entire North Atlantic, crosses the Equator, and can be traced past South Africa. At still greater depths water from the North Atlantic flows south, and along the bottom water from the Antarctic flows north as far as the middle of the North Atlantic.

In general, the California scientist reported, the oceanic circulations of the Atlantic and the Antarctic are better known than the water movements in the Pacific and Indian oceans.

Science News Letter, July 2, 1938

PUBLIC HEALTH

Parran Endorses $200,000,000 Anti-Tuberculosis Campaign

SURGEON GENERAL Thomas Parran, Jr., of the United States Public Health Service endorsed a $200,000,000 drive by the National Tuberculosis Association for the complete eradication of the "white plague" in the United States.

The plan for tuberculosis control, worked out by a committee headed by Homer Folks, executive secretary of the State Charities Aid Association of New York, was adopted by the association at its thirty-fourth annual meeting in Los Angeles.

The suggested program, to start in 1939, would require $140,000,000 for the construction of 40,000 hospital beds for tuberculosis patients. Funds for this job, it was indicated, would come from a variety of sources, including state governments and Federal funds from such sources as the Works Progress Administration, which has already provided hospitals and equipment totaling nearly 10,000 beds.

Industry Blamed

The unwillingness of industry to reemploy ex-tuberculous persons may force the adoption of an expensive Federal and state pension system, Edward Hochhauser of New York's Altro Workships, an institution for providing work for arrested cases of tuberculosis, warned.

Speaking before the National Tuberculosis Association, Mr. Hochhauser termed such a refusal to rehire former sufferers from the "white plague" unsound economically and sociologically.

Tuberculosis no longer should be looked upon as a permanently disabling disease and more attention must be paid to rehabilitation work, it was said generally before the association, holding a symposium on handling of arrested or cured cases.

Scoring industry's unwillingness to employ these people, Mr. Hochhauser declared:

"The testimony of industry can now be added to that of sheltered workshops. Responses from several hundred employers indicate that a very substantial number of employable tuberculous go back to their old jobs or some readjusted job with their old employer, many on part time.

"Sheltered workshops and colonies for patients have demonstrated that men and women may gradually return to normal work with partial or complete self-support."

Asks Social Security

A plea for Social Security relief for the families of tuberculosis victims was made by Homer Folks.

Speaking at a luncheon meeting of the National Conference of Tuberculosis Secretaries, Mr. Folks called suitable relief for the families of sufferers an essential factor in work remaining to be done in eradicating the disease.

Wants Control for Homeless

Some form of Federal control for homeless, transient tuberculosis sufferers who spread the disease in the communities they visit was urged.

Thousands of homeless men and women, ill with the "white plague," are a constant menace to healthy communities throughout the country, Dr. Halbert L. Dunn of the U. S. Bureau of the Census, declared.

Arizona, Colorado and New Mexico, meccas for sufferers from tuberculosis, face particularly acute problems in dealing with the disease, Dr. Dunn stated, because of the large number of out-of-state sufferers who flock there.

The Federal control suggestion was made by Dr. H. E. Kleinschmidt, director of health education of the association, and James G. Stone and Zdenka Buben of Los Angeles. The transient problem is complicated. Dr. Kleinschmidt added, because of the difficulty communities have in caring for their own residents.

"The non-resident is scorned and shoved from place to place," he continued. "What communities do not seem to realize is that the tuberculosis wanderer sows the seeds of his disease in countless stable communities.

"The only hope of solution lies in some form of Federal control or cooperation for the footloose patient, who, although he has forfeited his rights of residency, is yet an American citizen."

Science News Letter, July 2, 1938

PALEONTOLOGY

Earth's Earliest Edens Untroubled by Serpents

SNAKES are a comparatively new thing under the sun. In the Age of Reptiles, that ended only 50 or 60 million years ago, they were almost unknown. Only the last of the dinosaurs, that lived in Cretaceous times, ever had a chance to see snakes, and those were of the earliest models and probably not numerous at that. At least, their fossils are exceedingly rare today.

Data on the relative recency of snakes are included in a new monograph on Fossil Snakes of North America, written by Charles W. Gilmore of the U. S. National Museum and published by the Geological Society of America.

Snakes really began to get down to business on this planet at about the same time that mammals started their long climb to domination. Newcomers together, the snakes and we.

The first snakes were non-poisonous, resembling modern blacksnakes and boas in that respect. Venomous species did not appear, so far as the present record shows, until upper miocene time, roughly from 13 to 18 million years ago. First rattlesnakes began buzzing in the

ANCESTRAL SNAKE

As freed from its stony matrix by the delicate-fingered skill of N. H. Boss, U. S. National Museum preparator, this is the most nearly complete fossil snake skeleton ever seen in this country.

geologic period immediately after that, the pliocene, which lasted from 13 million years ago until the Ice Age began, about a million years back.

Prize specimen in the collection studied by Mr. Gilmore is the practically entire skeleton of a snake embedded in a slab of shale from the Green River formation, in the northern Rockies. Because of the slenderness and fragility of snake bones, it is rare to find well-preserved fossils at all; no skeleton so nearly complete as this has ever been discovered.

Technique combining the skills of sculptor and dentist was necessary to free the fine bones from their stone matrix, but it was finally accomplished without mishap. This early invader of the American Eden was a serpent a couple of inches over a yard long. It has been given the scientific name *Boavus Idelmani.*

Science News Letter, July 2, 1938

A blue whale's coat of blubber is three to six inches thick all over its body.

GEOGRAPHY

China's Vast Flood Threatens To Unite Hwang Ho and Yangtze

Devastating Famine and Pestilence Expected to Follow As Muddy Waters Disrupt Programs of Both Peace and War

TERMING the history-making flood of China's Sorrow the worst flood disaster within the memory of man, Dr. Walter C. Lowdermilk, one of the world's foremost authorities on soil erosion, declared that there is small probability of bringing the Yellow River under control or of returning the river to its old course.

A disaster of even greater magnitude than the one which has already struck China will occur, he predicted, if the Hwang Ho, the world's worst acting river, joins the Yangtze Kiang, China's mightiest stream.

Floods for Kiangsu

Such a junction, which some reports declare to be taking place already, will mean floods for Kiangsu province, the most populous district in China, as well as the provinces already afflicted. Kiangsu province contains Shanghai. While the city itself would probably escape, wide destruction of farmlands in the district would be made inevitable in the combined rivers' search for an outlet to the sea.

The breaches in the dykes are so wide and the river bed is so far above the surrounding delta plain that return of the stream appears impossible, Dr. Lowdermilk predicted. This appears especially true, he indicated, because of the fact that the peak of the floods does not reach the stricken lowlands until mid-July. The worst is yet to come.

Dr. Lowdermilk, who is chief of the division of research of the Soil Conservation Service, U. S. Department of Agriculture, spent five years in China, between 1922 and 1927, surveying soil erosion and flood conditions of the Yellow River for the Permanent Famine Prevention Project of the University of Nanking.

No estimate of the extent of the damage or number of lives lost directly as a result of this greatest of all catastrophes is possible at this time, but the toll is certain to run into millions, he believes. The flood is certainly far worse than any previous disaster of its kind; it already outranks the flood of 1852 when the stream last changed its course. While vouchsafing no statement as to blame for the flood or any comment on the Japanese claim that Chinese themselves breached the dykes, Dr. Lowdermilk pointed out that the war made impossible this spring the annual repairs to the dykes that wall in the river. So thin is the safety margin of this ever-mounting stream that missing repairs even for a single year can result in a great disaster. The artillery fire in the neighborhood was no help.

The Yellow River's bad acting, he indicated, might be said to go back to the Ice Age when high winds deposited over an area thousands of square miles in extent a loose, fine-grained soil known as loess. Contrary to general impressions, excessive rainfall is not the cause of the recurrent floods of the Yellow River. It is this loess, which is readily eroded away by running water and through which the Yellow River flows, that is deposited in the great delta plain hundreds of miles away, where the river slows down.

One-Quarter Mud

Dr. Lowdermilk has found a mud content as high as 24 per cent., while another observer, Oliver L. Todd, a civil engineer with whom Dr. Lowdermilk worked on his study, found an even higher mud burden.

This enormous burden, when deposited, builds up the river bottom and, in the case of the Yellow River, not so gradually at that. Chinese have been forced to build their dykes ever higher as the river bed itself has risen, until today the river bed in many places is as high as 30 feet above the surrounding plain. Any breach in the retaining walls means a rushing wave of water engulfing the countryside.

Now that the breach has been made —there is more than one gaping hole, to be sure—putting the river back where it belongs appears to be like damming a hundred small Niagaras with only hand labor to do the job.

Joining the Yangtze Kiang, ranked already as one of the three or four greatest rivers in the world in volume of

IN THE ROYAL CITADEL

A greatly enlarged model of a small section of a tropical termite "city" has been placed on display at the Buffalo Museum of Science. Interest centers in the royal chamber, where the enormous-bodied queen and her mate are attended by workers. An immature winged form is seen near upper left, and at lower right is a fully mature winged insect ready for its nuptial flight.

water, appears to be more than possible, for the Yellow River is connected with the Yangtze through the Hwei River and the famous Grand Canal. The streams which connect the Yellow and the Hwei already flow downward from the Yellow to the Hwei.

Some idea of the vast amount of mud carried by the flood may be gained from the fact that Shantung province, now a peninsula, was once an island. The silt delta connecting the mainland and Shantung is the world's largest delta, measuring 400 miles on a side. It has been laid down by the Yellow River through the ages.

Bruised by war and battered by flood, stricken China now appears to have two new tragic trials in store for her.

The worst famine in the Far Eastern land's many centuries of periodic mass hunger and one of the worst epidemics of disease in the annals of mankind seem now to be inescapable as a result of the flood of China's Sorrow, the mighty Yellow River.

The flood of the great Hwang Ho, whether man-made or brought on by natural causes or both, is not going to recede at any time soon. It is going to get worse. Pouring into the great plain of the provinces of Honan and Shantung on the heels of the torrential rains will be the "spring melt" from the mountains of far-off Tibet, the Yellow River's source. This peak may be expected about mid-July.

Two factors, flood and war, make the situation more serious than ever before. Cutting wide swaths through fertile farmlands as much as 30 feet below the bed of the river, the Hwang Ho is adding indescribable destruction of crops in China's granary to the extreme dislocation caused by the war waged in that region.

To the millions already made homeless by the war are being added the millions now homeless as a result of the flood. When the defeated, but not conquered, Chinese armies retreated westward, with them went uncounted millions of civilians fleeing the Japanese. Their care and, particularly, their feeding became a burden thrust upon Honan and Shantung, already burdened by having to support upwards of a million men under arms.

To this already acute food problem is added the problem of feeding those who can look forward now to nothing but a harvest of muddy water from their rice paddies and grain fields. And, it must be remembered, even in the best times, food is scanty enough in China.

It is on these facts that the expectation of a devastating famine is based. That famine will strike a population, a large portion of which are already weakened in their resistance to disease through China's semi-permanent state of mass malnutrition and as a result of the protracted war. The epidemic of disease, which may be cholera or typhus or both with dietary diseases as complication, is predicted upon the basis of the regularity with which disease follows flood and famine, particularly in a land where sanitary conditions are poor.

Reports from China during the past few months have persistently reported that Chinese refugees and soldiers alike are badly infested with typhus-carrying lice. An epidemic of typhus of major proportions is already regarded as long overdue. That such an epidemic will not take hold and spread with terrible rapidity in the severe conditions attending the flood—hunger and overcrowding among refugees of both the war and the waters—appears to be something not even the world's most enthusiastic optimist could hope.

Science News Letter, July 2, 1938

PHYSIOLOGY

Nerve Unbalance Declared Essential Cause of Old Age

OLD AGE was explained in terms of lack of balance between two sets of nerves in a report by Dr. David R. Higbee of San Diego, Calif.

The balance is between the sympathetic and the parasympathetic divisions of the autonomic nervous system. This system regulates the action of the ductless glands, the blood vessels and the internal organs.

The systematic division of this nervous system, Dr. Higbee explained, is not essential to life and is functionally active under emotional, physical and biochemical crises. The parasympathetic division is "the very essence of life," he declared. It functions constantly, building up reserves in the body and carrying out the coordinated adjustments of internal organs.

These two divisions of the autonomic nervous systems are antagonistic. The healthy state of every tissue depends on a balance between them which is normally maintained.

"Old age," Dr. Higbee said, "is the expression of the permanent disintegration of this balance."

Science News Letter, July 2, 1938

There is some reason to think the Assyrians played the bagpipe.

MEDICINE

Modern Social Conditions May Cause Digestive Disorders

Sturdy Blondes Less Liable to New Illness Than More Excitable Brunettes; Ulcers Linked to Hormones

A NEW kind of sickness, product of modern times but one which rarely affects a sturdy blonde, was described by Drs. Charles W. Mayo and E. G. Wakefield of the Mayo Clinic at the meeting of the American Medical Association.

"Sociologic disorders" is the name the Mayo physicians have coined for this condition. Symptoms are ailments of digestion including the fashionable "colitis."

Basic causes arise from the exacting competitive and machine-like routine which modern man has imposed on himself. They include such things as time clocks, trading at bargain counters and paying bills on the installment plan. Sickness, accident, unexpected loss of money, property or job, death in the family, betrayal of confidence by a friend, migration or change of church, party or occupation may start the trouble.

Watch Diagnosis

Physicians treating patients with digestive disorders must of course rule out organic disease before making a diagnosis of "sociologic disorder," the Mayo physicians warned. Treating the patient for "colitis" will not help him if he suffers from "sociologic disorder," they said. Cure must be attempted through scientific control of the adverse social conditions.

Advertisements of remedies for autointoxication and colitis were criticized as constantly tantalizing the fearful and suggesting "unnecessary care, unhygienic and unphysiologic requirements of the colon."

Discussing causes of sociologic disorders, the Mayo physicians said that one feature of heredity seems important inasmuch as sturdy blondes rarely are troubled with this condition which typically affects the tall slender brunette. Otherwise they find heredity of little importance, going so far as to say:

"It is not true that what man is was foreordained when he got his supply of genes in the germ cells."

Sinus disease starts in infancy and the first five years of your life were the most important ones for determining whether or not you would be plagued with this ailment, it appears from the report of Dr. W. Walter Wasson of Denver.

Dr. Wasson advises warm air for sinus sufferers. On this point, he said:

"Fresh air with oxygen is desirable and many times necessary, but I doubt if this air should be cold. Patients with chronic sinus disease do better if their sleeping rooms are well ventilated, but ventilated with warm air of the proper humidity."

Seasonal Sinusitis

This advice on treatment is based on the observation that most young children with sinus disease show a seasonal cycle, their sinuses showing a definite lack of air supply beginning about October and continuing till warm weather returns. Such children, Dr. Wasson believes, would be better off in a warm climate in the winter and attention should be paid to the air in their sleeping rooms.

Discovery that sinus disease starts in infancy was made with X-rays. At birth, Dr. Wasson reported, the sinuses are filled with material which must be removed. This process takes from two to five weeks and the degree of clearing conditions the future development of sinus disease. Children whose sinuses clear promptly have fewer attacks of sinus trouble later in life. If the nose clears on only one side or not at all, sinus trouble usually occurs later.

If the disease develops in infancy it may subside by the fifth birthday, but it it does not, it becomes more definitely established, with changes in the tissues and bones.

The reason that stomach ulcers occur four or five times as often in men as in women is apparently linked to a difference in sex hormones. Doses of one of these hormones which is produced in large quantities in pregnancy cured eight out of fifteen stomach ulcer patients, Drs. David J. Sandweiss, H. C. Saltstein and A. A. Farbmanx of Detroit reported.

This treatment, however, is not recommended by the Detroit doctors because they feel that it is too experimental for general use. The particular hormone they use is the anterior-pituitary-like hormone known as A. P. L. in medical slang.

Besides relieving ulcer symptoms in these patients, this hormone prevented or healed ulcers produced experimentally in dogs in 70 per cent. of the animals. The reason the doctors do not advocate its use in treatment of patients is because they are not sure yet whether the results are due to the hormone itself, to an impurity in the commercial preparation, or to some yet unidentified substance excreted with this hormone.

Hormonic Ulcers

Reasons for attributing chronic peptic or stomach ulcers to the pregnancy hormone are as follows:

Only one case of stomach ulcer was found in 70,310 pregnant women at Harper Hospital, Detroit, although plenty of other gastric disorders such as appendicitis and gall bladder disease occurred in these women. Glandular disorders were found in more than half of the female ulcer cases.

Stomach ulcers, although rare in children, occur equally often in girls and boys but in adults are found four or five times more often in the male.

Science News Letter, July 2, 1938

ENGINEERING

Engineering Students Need More Fundamental Studies

LESS slide rule pushing, less plotting of graphs, fewer courses and hence more time for a real basic understanding of engineering principles were urged by speakers at a symposium on engineering education.

Too many students now being graduated in electrical engineering, it was stressed, learn a set of shortcut methods which make them robot thinking machines without having a proper understanding of the underlying principles of mathematics and physics on which all engineering is based. The method of achieving better coordination between these two sciences and electrical engineering was the object of the discussions.

Science News Letter, July 2, 1938

PHYSIOLOGY

Vitamin A Necessary For Proper Functioning of Eye

VITAMIN A, known to be necessary for the proper functioning of certain elements in the retina of the eye, has now been demonstrated as apparently necessary for all of it, by Drs. Charles Haig, Selig Hecht, and Arthur Patek, Jr., of Columbia University.

The sensitive cells in the retina are of two shapes, known respectively as rods and cones. Each class is sensitive to a specific range of light intensity, so that if either is disabled, vision is partially impaired. Vitamin A was known to be necessary for normal functioning of the rods, but hitherto it was not known to be necessary for the cones.

Patients suffering from alcoholic cirrhosis of the liver furnished the key in the present researches, which are reported in (*Science*, June 10.) Cirrhosis patients are known to have trouble with their vision, particularly in their ability to see in dim light after being in bright light—the phenomenon known as dark adaptation. This is tied up with defective working of the retinal cones.

Two alcohol-cirrhosis patients were selected for the experiment. They were fed heavy doses of vitamin A as supplements to their diet. Definite improvement was noted in visual functioning dependent on the retinal cones. It appears therefore that Vitamin A is as necessary for these parts of the retina as it is for the rods.

Science News Letter, July 2, 1938

PHOTOGRAPHY

Red Blood Corpuscles Used as Light Filter

A NOVEL color photographic process that would use a layer of differently dyed red blood corpuscles as filters for separating colors in order to record them on film has been patented by Chalmers C. Smith, of Glendale, Calif., and Ray H. Pinker of Los Angeles.

Mr. Smith and Mr. Pinker would use corpuscles from animals such as sheep, according to the patent specifications accompanying Patent No. 2,115,886.

Use of the corpuscles, the inventors claim, represents an advance over present color photography technique, which uses either a ruled screen or a layer of starch grains to achieve the color separation.

Colored motion pictures and still photographs are all made essentially by using one or another means to separate the three primary colors that make up all shades and tints and to record them separately, then put them together again for viewing purposes.

Practical development of the unique process might well mean a fundamental change in the technique of making colored motion pictures used at present. These are made by means of a triple-coated film, one layer with its associated filter being sensitive to one of the primary colors. This process has, however, serious practical limitations. The screen processes are not used in commercial color motion pictures because the starch grains and the rulings show in the enlargement thrown on the screen.

The red blood corpuscles of sheep, .003 millimeter across, are sufficiently small so that when enlarged 240 diameters in being thrown on a screen as in motion picture projection, they would still be less than a millimeter in diameter, a size small enough perhaps not to show.

A further advantage claimed by the inventors for their idea of using a corpuscle screen is that the corpuscles are more translucent than starch grains, cutting down the amount of light required for taking pictures, and are also more regular.

Science News Letter, July 2, 1938

MEDICINE

Sulfanilamide Chemical Combats Meningitis

TREATMENT of meningitis with sulfanilamide, new and potent chemical remedy for many infectious ills, was reported by Dr. John A. Kolmer of Philadelphia at the meeting of the American Laryngological, Rhinological and Otological Society.

The greatest effect is obtained when the drug is given as early as possible and according to a specific dosage scale, Dr. Kolmer told his fellow physicians. His advice was based on laboratory studies made with the assistance of Anna M. Rule and Mary L. Werner.

Sulfanilamide is more effective in treating meningitis due to streptococci than that due to pneumonia germs. Best results are obtained in sulfanilamide treatment of meningitis when the drug is given both by mouth and by injection under the skin with occasional doses injected directly into the spinal fluid.

Science News Letter, July 2, 1938

IN SCIENCE

AVIATION

Airplane Made From Plastic-Bonded Plywood

OPENING up wide possibilities for rapid manufacture and assembly of airplanes, a plane whose fuselage is made from two pre-molded pieces of plywood bonded by a synthetic plastic is being readied at a Hagerstown, Md., factory for acceptance tests by the Bureau of Air Commerce.

The new plane, built by the Clark Aircraft Corporation, already has more than 60 hours in the air to its credit and is reported to be highly promising in performance.

The U. S. Army is interested to the point that it has a similar plane, made by the same manufacturer, under trial by the Materiel Division of the Air Corps at Wright Field, Dayton, O.

Great importance is attached to this and similar developments in view of the quick-manufacture possibilities inherent in plastic materials and to concentrated attention such planes have been receiving abroad.

The plane's fuselage is made of two molded halves which are made of a laminated plywood bonded by a synthetic resin developed in Germany.

With a gross weight in the neighborhood of 4,500 pounds it is about the same size as the larger private planes. This model is equipped with a 450-horsepower 12-cylinder V engine.

Planes made of plastic materials have been tried in the United States several times in the past, but they have not made great progress to date. An advantage derived from use of the material is speed in assembling the fuselage. Since airplanes are still largely hand-assembled, this is a factor of importance.

Although it is understood that the material used in this case was not one of those tested by the National Bureau of Standards, laminated plywood of the type used has a high strength to weight ratio, an all-important consideration with aircraft.

Science News Letter, July 2, 1938

Whether or not silk is weighted cannot be determined just by feeling it.

CE FIELDS

MEDICINE

Alcohol Protects Against Trichinosis Organism

FOR protection against trichinosis, take a drink of beer, wine or other alcoholic beverage with your hot dog, hamburger or other meat that might harbor the germs of this serious ailment.

The alcohol will keep the larvae of the trichinosis germs, called trichinella, from burrowing into the walls of the digestive tract, Drs. James B. McNaught and G. N. Pierce, Jr., of Stanford University School of Medicine, told members of the American Society of Clinical Pathologists at their meeting in San Francisco.

Trichinosis is surprisingly widespread in the United States, recent surveys have shown. The disease is acquired by eating meat, usually pork, containing the trichinella. Thorough cooking kills the trichinella and makes the meat safe but sausages and hamburgers are usually not cooked long enough to kill the trichinosis germs.

Alcohol does not kill the germs, either, the Stanford scientists found. However, a single dose of alcohol given to rats simultaneously with trichinous meat gave 80 per cent. protection against the disease. The alcohol cuts down the number of trichinella larvae developing in the rat muscles and reduces the severity of the infection.

Alcohol, the studies showed, is no good as a treatment for the disease, only as a preventive. Large doses given continuously for more than six weeks gave practically no protection when the first dose of alcohol was given longer than 48 hours after eating infected meat.

Science News Letter, July 2, 1938

MEDICINE

Large Blood Cells Assist In Recovery From Pneumonia

DISCOVERY of a new body mechanism which helps toward recovery from pneumonia was reported by Dr. Oswald H. Robertson of the University of Chicago.

The new mechanism consists of certain large, germ-eating cells which appear at a certain point in the disease, engulf the red blood cells, the white blood cells which had previously fought the pneumonia germs, and the germs themselves. As soon as these large cells appear, the patient begins to recover, it is believed.

This mechanism alone is not considered enough to bring about recovery. Dr. Robertson thinks there is some general still-undiscovered process which does part of the job. Part of the recovery mechanism must lie in the pneumonia germ-killing power of the blood, he said, any other factor being unknown. If both parts of the recovery mechanism are effective, recovery occurs, but if either one fails, death follows.

Resistance to pneumonia by means of a substance in the blood that kills the germs is not enough to prevent the ailment, Dr. Robertson believes. Experiments with dogs showed that if there is obstruction of the air passages in the lower part of the respiratory tract, where the lung's mechanism for getting rid of foreign material is not extensive, the disease may develop even if the blood has germ-fighting antibodies. Such an obstruction may occur in a cold when the infection reaches the lower part of the breathing system.

Science News Letter, July 2, 1938

ORNITHOLOGY

Siam Has Three Kinds of Migration Among Birds

BIRDS of Siam have three kinds of mass migration, instead of the one kind that is known to temperate zones. Besides the usual north-and-south seasonal movement in which many Siamese species take part, there are also a water migration and a food migration, reports H. G. Deignan of the Smithsonian Institution.

The water migration consists in the movement of vast numbers of water birds toward higher land areas with the coming of the rainy season and its attendant higher water levels in swamps and shallow lakes.

The food migration may be simply the result of scouting activities, in which certain individual birds discover places where mangoes, wild figs, and other fruits are ripe, and are then followed by the millions of members of the main flocks. Food migrations are indulged in only by birds of the pigeon and parrot families.

Science News Letter, July 2, 1938

BIOCHEMISTRY

Wins First Award of $2,000 Harvard Prize

DR. Wendell Meredith Stanley of the department of animal pathology of the Rockefeller Institute for Medical Research at Princeton, N. J., has been named as the first winner of Harvard's Isaac Adler prize of $2,000.

The award was made "for his researches on the isolation of a crystallizable factor which have developed a new approach in the study of viruses, thereby stimulating a widespread interest among works in this important field." (See SNL, Jan. 9, 1937)

The prize was established in 1934 under a bequest of $20,000 of Mrs. Frida Adler of New York in memory of her husband. Under its terms, the prize is awarded every three years "for the best piece of original research produced within that period in the United States or Canada on any subject within the medical or allied sciences."

Science News Letter, July 2, 1938

GEOLOGY

Gems Reveal Dates Of Mountain Building

GARNET and tourmaline, staurolite and zircon, and a host of other heavier-than-average semi-precious stones now have a new use—telling the age of mountains. In the Big Horn Basin of Wyoming, Dr. Marcellus H. Stow, Washington and Lee University geologist, is tracing the source of the ancient sediments back to the still more ancient mountains from which they came.

Piled one over the other, with the youngest on top and the oldest below, the Cretaceous and Eocene sediments of the area were derived from the wearing away of the highest of the ancient Rocky Mountains.

Thus, the Hell Creek beds contain abundant zircon in all samples, suggesting their origin from a zircon-containing mountain. They contain no hornblende, showing that the source of the sediments was hornblende-free. Further studies show that the Hell Creek beds were derived from the erosion of sediments.

Each bed of the series present in the Bighorn basin was likewise studied for heavy minerals, and its probable source determined. From this, Dr. Stow hopes to determine which areas were "up" during each phase of the Laramide period of mountain-building, 90,000,000 years ago, more or less.

Science News Letter, July 2, 1938

PSYCHIATRY

Suicide Is a Disease

It May Even Be Chronic When Individuals Let Their Hate Turn Inward and Constantly Punish Themselves

By MARJORIE VAN DE WATER

DURING the last 24 minutes somewhere in the United States a man has killed himself.

Suicide daily brings sorrow into the world. Sorrow and perplexity, too, for despite the fact that self-destruction is so common it is very little understood. Every one of us would like to know what we could do to save these lives tragically wasted, but very few know how to go about preventing or relieving the depression that leads to self-murder.

Searching into the minds of many would-be suicides, Dr. Karl A. Menninger, founder of a clinic for nervous and mental diseases, has learned surprising things that may in future aid physicians and friends in preventing men from killing themselves.

Suicide by Inches

Suicide is a disease, Dr. Menninger says in his book, "Man Against Himself." (Harcourt, Brace and Company). It is a disease which afflicts many persons who never actually die of it.

"Chronic suicide," Dr. Menninger calls this ailment which is endured by many of our neighbors.

The alcohol addict who throws away job, friends, reputation, health and even family because of a compulsive need to get drunk is actually engaging in a lingering, extremely painful suicide, Dr. Menninger declares.

The neurotic patient who loses the use of parts of her body without organic cause is also killing herself by little bits.

The criminal who is extremely audacious and yet incomprehensibly stupid is actually, perhaps unconsciously, inviting capture and punishment. He returns to jail or prison again and again because the crime itself and the lack of caution in concealment are the result of a similar compulsion to injure not only others but himself. Normal criminals there may be, Dr. Menninger says, who do not have this reckless suicidal attitude, but they are the ones who manage to continue their depredations because they stay within the letter of the law or because they are not betrayed by "accidental" little acts of apparent stupidity or carelessness that bring them before the bar of justice.

Sometimes men kill themselves only in their thoughts. Such persons are familiar to physicians who treat mental disease, for they are usually insane. In their delusions, they may believe themselves to be dead or they may think only that parts of their bodies are useless or gone. Often it is the eyes; the victim of this sort of suicide will be convinced that he is blind, he insists that he has no eyes at all.

Sometimes men torture themselves. You have probably seen your friends grow angry and destroy part of their belongings or clothing in the height of their rage. The abnormal go further; they may literally tear out hair, kick or gouge themselves. As the normal man may bring down his fist so hard that he bruises his knuckles, so the abnormal may more deliberately cut or crush his hand.

More subtle is the action of a man who repeatedly gets himself into accidents. He falls off a ladder, he drives into a telegraph pole, he gets his hand caught in industrial machinery, or jaywalks in front of an oncoming automobile.

Poor Accident Risks

"Hard-Luck Champions" is the name given these men popularly. Insurance men call them the "accident prone"; they regard them as poor risks for accident policies for it is recognized that such persons are much more likely than other men to fall into new accidents in the future.

Relatives and friends, without saying so, may incline to the opinion that there is something wayward in such "carelessness," or they may blame it on a "jinx." The jinx, according to Dr. Menninger, is the suicide disease. Without being conscious of the fact, some men really want to get into accidents because in this way they punish themselves while at the same time they become the center of attention, get their names in the newspapers, receive flowers and sympathy and perhaps damages or insurance.

More than 16,000 pedestrians walk to their death each year, statistics of the National Safety Council indicate.

"We are sure that some of these 16,000 deaths were the fault of the victim," comments Dr. Menninger, "and my endeavor is to show that frequently this cannot be explained away by such a word as 'carelessness.' After all, to be careless with one's own life is in itself a symptom and from my point of view a symptom directly related to the self-destruction impulse."

The impulse is less readily detected in the person who submits or insists on periodic surgical operations. Like the neurotic patient, he can produce symptoms that are real enough, yet they may be induced or aggravated by himself.

Self-Mutilations

Less hazardous, but just as significant of inner tensions, are the various habits of self-injury and self-mutilation in trivial ways—hair pulling and chewing, nail biting, lip biting, head and skin scratching and the picking at and aggravating of skin eruptions and wounds.

Sometimes, customs of partial self-destruction have become socially acceptable. The daily ritual of shaving, clung to by modern males in the face of annoyance, pain, and the sacrifice of his distinctively masculine beard, is such a generally approved practice of self-punishment, according to Dr. Menninger. He points to many primitive customs having to do with cutting the hair and shaving the head, the American Indian regard for the scalplock, and the abnormality of certain individuals who steal hair as indicating that this custom has its origin in what he calls "focal suicide."

The tortures that women, and men too, suffer at the hands of the manicurist are another example of socially approved partial self-destruction. In this case what is given up is a weapon, and one suspects that the social arbiters who started the custom of nail trimming may have had good reason for so doing. Plucking eyebrows is even more painful but less socially useful.

But if, instead of having your nails trimmed in proper style at the beauty parlor, you gnaw them off yourself because of a powerful inner urgency, you show that "tooth and claw" are not be-

ing used in the way that nature intended.

It is hate that makes men punish and kill themselves, Dr. Menninger has found. Love never destroyed life. Yet in every person with suicidal tendency a conflict is going on between the dark forces of hate and destruction and the other powerful forces that make man want to build, create and love. It is the constructive force that prevents the success of suicide attempts.

These constructive and destructive forces are present in every man, just as they are in the physical world.

"To create and to destroy, to build up and to tear down, these are the anabolism and katabolism of the personality, no less than of the cells and the corpuscles—the two directions in which the same energies exert themselves," Dr. Menninger said.

These forces, as the personality develops in childhood, are directed outward. The individual invests, as Dr. Menninger puts it, certain parcels of hate and love in other persons or in the places and objects around him.

Fight Themselves

But suppose the individual fails to mature in this respect. Then these forces turn in on the self.

"Instead of fighting their enemies," Dr. Menninger says, "such persons fight (destroy) themselves; instead of loving friends or music or the building of a house, such persons love only themselves."

"But no one evolved so completely as to be entirely free from self-destructive tendencies: indeed, the phenomena of life, the behavior peculiar to different individuals, may be said to express the resultant of these conflicting factors. A sort of equilibrium, oftentimes very unstable, is achieved and maintained until disturbed by new developments in the environment which causes a re-arrangement with perhaps a quite different outcome."

When a person becomes so self-centered that all his love is focused on himself and all of his hate turns inward then he is in a bad way. Conflict results. If self-love, triumphs, then we see the self-indulgent egotist. If hate triumphs, then we have the person who unwillingly tortures himself to no purpose, who makes a martyr of himself by work or meaningless sacrifice so that he and all around him are miserable, and who may in the end destroy himself.

Ingrowing hatred may begin in early childhood. Many a man and many a woman, Dr. Menninger points out, goes through all of life taking out on others or on himself the grudge he has against life—a grudge perhaps founded on abuse or neglect in his childhood.

Never was a child spoiled by too much love, declares Dr. Menninger. When indulgent parents spoil a child, it is because the indulgence is not a sign of warm parental love but a thin veil for an antagonistic attitude that may range from annoyance to actual hatred. The unwanted child can look intuitively through the disguise and knows that he is rejected. Usually such parents vacillate between excessive indulgence serving as salve to their consciences and cruel punishment or neglect.

Shun Human Contacts

Sometimes the harsh treatment from a loved one comes later in life and outside the home. In either case, the child withdraws like a sensitive plant from human contacts. He is afraid to trust or love anyone. Instead he hates. And if he is a "good" child or a timid one he hates not others but himself.

Gradually the life of such a person is narrowed. He offends others so often that he has no friends. Men and women avoid him. He has no interests, pets, or hobbies on which he can lavish affection or zeal. At last, nothing in life is worth while to him. He is poor company for himself, yet cannot go outside his own narrow confines.

The first step in building up the mental health of such a person, Dr. Menninger says, is to induce him to transfer some of his emotion to outside objects. Easiest, perhaps, to achieve is a transfer of hatred.

When, in the mental hospital, the suicidal patient begins to swear at the doctors and explode in temper at the nurses, it is regarded as a good sign.

The next step is to suggest delicately more suitable objects for hatred. Goodness knows man has enough enemies to serve such a purpose. From insidious germs to the terrible forces of storm and flood, man has much to fight. Chopping wood, or weeding in the garden are excellent ways of working off destructive impulses. Think of the destructive energy that might be consumed in exterminating ragweed! Equally efficacious are football, any sort of competitive athletics, chess, politics, business and even watching the fights of others.

Inanimate objects may serve as a means for venting spite. Says Dr. Menninger:

"It is certainly more desirable for a man to pound a punching bag or walk miles in pursuit of a golf ball than to exert the same energy in attacking the reputation of his neighbor, the peace of mind of his wife, or the functioning of his own heart.

"Still better, of course, so far as secondary and material benefits are concerned, would be the application of this aggressive energy to the problems of the field, the forum, and the factory. Indeed, probably all work represents in large measure this 'sublimation' of aggressions, aggressions directed against what Ernest Southard called 'The Kingdom of Evils'; ignorance, crime, vice, disease, poverty—and let us add ugliness, and even aggressiveness itself."

But diverting hate to outside objects is not enough. Another part of the suicide disease is the element of self-punishment—punishment for an inescapable sense of guilt. The best way to get rid of the feeling of guilt, conscious or unconscious, is by atonement, Dr. Menninger says. Friends and physicians of the suicidal patient should introduce to him methods of atonement that will be useful to society.

When he bangs his head against the wall, it may relieve his feelings, but it does no one else any good. If, however, he gives money to the hungry or for

PARTIAL SELF-DESTRUCTION

Nail and lip biting are another and milder form of suicide disease. The child, in such cases, may be taking out on herself the irritation and nervous tension built up by adults for whom she has such love or respect that she cannot "sass" them back.

SUPERFICIAL SUICIDE

Tattooing is a form of self-torture combined with a satisfaction of the desire to show off.

scientific research or his time in the service of the community, his efforts are constructive.

Religion has its very definite therapeutic effect in this connection, Dr. Menninger indicates. For many people, the ritual of the confessional can serve to relieve the overburdened conscience.

Last, but not by any means least, it is necessary for the suicidal patient to build up his capacity for love.

"He who seeketh his own life shall lose it but whosoever loseth his life for my sake shall find it." These words of the Great Physician apply to the suicidal patient, Dr. Menninger said. He who would learn not to destroy his own life must give up some of his self-esteem and invest his love in others.

The making of friends is an art and should be cultivated. If the personality is too weak to cultivate human friendships, develop an interest in music, art, crafts, or some engrossing hobby.

Work, a splendid way of getting rid of hates, is also one of the best and most available means of developing the creative impulses. In social work, teaching, the ministry, medicine, and many another profession and business one may lose oneself in true creative endeavor to the endless benefit of mankind and the restoration of mental health.

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ENGINEERING

Few Simple Rules in Driving Greatly Increase Car Mileage

WHILE motor car manufacturers do everything possible to increase the gasoline mileage of their automobiles, the owner of the car, through proper driving, can also do plenty to decrease his gasoline consumption.

In a report presented to the Society of Automotive Engineers, W. E. Zierer and J. B. Macauley, Jr., of the Chrysler Corporation, cited a recent driving test in Detroit.

A ten-mile course was laid through the city and the same car was driven over the route in two ways. First it was pushed to make the trip as fast as possible while keeping within a 30-mile-an-hour speed limit. All gears were used and speed was the watchword. It took 39 minutes to make the trip and the gasoline consumption was 8.5 miles to the gallon.

Next the same car was taken over the route using best driving practices—such as coasting up to stoplights in neutral, starting in second, accelerating slowly, etc.—which would give economy. It took 44 minutes to make the same trip this way. The mileage was 17 miles to the gallon!

Thus, at a sacrifice of five minutes time, the gasoline economy was improved 100 per cent.

Streamlining is Vain

Streamlining on cars, the engineers showed, was effective only at speeds too high to be used generally. By removable sections they completely streamlined a stock car and found that fuel economy was increased 56 per cent, at speeds of 80 miles an hour. But the gain was only 17 per cent. at 60 miles an hour.

This freak car had an additional, long tailpiece which gave it an overall length some 44 inches greater than normal. "This would be a sad tail indeed for traffic driving and parking," they add.

Thus while streamlining alone will not result in an improvement of existing tank mileage, it will have the result of permitting somewhat higher speed operation without seriously penalizing tank mileage.

Part of the owner's feeling about the mileage his car is yielding is mixed up with psychology, they pointed out.

A motor car owner, they said, measures economy by the number of times he has to reach for his pocketbook. They cited one case where complaints against poor mileage on a certain make of car were reduced greatly when a larger gas tank was installed.

New Engine Bearing

They are still in the laboratory and you can't buy one for any price, but automotive engineers are now studying a new type engine bearing for automobiles which will stand up after a test run equal to driving 30,000 miles at a speed of 80 miles an hour.

This pioneer, experimental bearing, whose composition is still undisclosed, was discussed by Arthur F. Underwood, mechanical engineer of the Research Laboratories Division of General Motors Corporation.

Tougher, longer-lasting and lower-priced bearings are continually sought, explained Mr. Underwood, because bearing loads are due to increase in the future. Higher octane fuels, supplying more power, and the advent of more Diesel engines are only two trends among many which are today stimulating research on bearings.

The ideal bearing, said Mr. Underwood, should have the following properties:

1. It should have the fatigue resistance of a copper-lead or silver bearing.
2. It should have the anti-friction benefits of a tin base babbitt bearing and the bond and mechanical strength of silver.
3. It should have the conformability, embeddability and corrosion resistance of babbitt metal.
4. It should have the low cost of copper and lead as against tin, cadmium, silver or indium.

Sleeve Valve Engines

Despite its intensive production of orthodox airplane engines for its rearmament program, Great Britain is still continuing experimentation on the sleeve valve engine, which has attracted wide attention in civil and military aviation circles.

A. H. R. Fedden, aeronautical expert of the Bristol Aeroplane Company, Ltd., who has just recently been awarded the 1938 Daniel Guggenheim Memorial Award for this development, told the Society that any adverse bias Americans may have on sleeve valve engines—based on their use in the now-defunct Knight type motor cars—is completely unfounded, for major improvements have since been achieved.

Sleeve valve engines require less maintenance than do the ordinary engines with overhead valves, widely used in automobile engines. The valves in the sleeve valve type are simply openings in the cylinder wall which are opened and closed by the up and down motion of the piston.

A total of more than 10,000 hours of running and flying experience with sleeve valve engines has now been obtained by the Bristol Company, Mr. Fedden declared.

Science News Letter, July 2, 1938

CHEMISTRY

Lignin, Common Waste Used in Water Softener

LIGNIN, waste product of the nation's forests, utilization of which scientists are continually seeking, is among the substances which can now be treated to produce a water-softening material, said Howard L. Tiger of the Permutit Company, New York City.

Coal, lignin or wood can be treated by a variety of chemicals to produce a blackish granular material known as Zeo-Karb which can decrease the alkalinity of raw waters.

Substances which produce this alkalinity help form boiler scale and cause corrosion in the boilers of steam generator plants.

Science News Letter, July 2, 1938

Photographs can be applied to pottery by a process similar to engraving.

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BOTANY

Honors for Longevity Reclaimed by Big Trees

HONORS for greatest age among living things are re-awarded to the Big Trees of western America in a summary study by the late Dr. Hans Molisch, formerly director of the Institute of Plant Physiology, the University of Vienna. Dr. Molisch's book has just been translated and published in English by an American botanist, Edmund H. Fulling, editor of *The Botanical Review*.

The Big Tree's only close competitor for record length of life, in Dr. Molisch's tabulation, is the baobab tree of Africa, which is given an estimated age of 5,000 years. However, this is only an estimate, whereas the equal age of the Big Tree is backed up by actual counts of annual rings in the trunk.

Next in line comes the banyan of India, sacred for having sheltered the Buddha. The identical tree under which Gautama sat when inspiration came to him is still pointed out, and since it has been a holy place during all the centuries, it is quite probable that the tradition is accurate, so that the estimated 3,000-year age of the "bo-tree" is well supported.

Not so well fares the giant cypress of Tule, in Mexico, at which stout Cortez marvelled, and which the famous German traveller, von Humboldt, estimated to be 4,000 years old. "Comparative estimates have indicated, however, that this swamp cypress can scarcely be more than 2,000 years old," says Dr. Molisch; "further proof that estimates alone easily lead to inaccuracies and exaggerations."

Even more drastic scaling-down in estimates had to be made for the age of the great dragon-trees of the Canary Islands, likewise claimed to be the world's oldest. Dr. A. Putter, who studied these trees critically shortly after the World War, would grant the oldest of them no more than 185 years. The claims of 5,000 or 6,000 years, advanced by natives for their trees, Dr. Putter dismissed as trivial, because the same natives "not infrequently do not know their own ages nor those of their children."

Science News Letter, July 2, 1938

ENGINEERING

High Costs Hinder Adoption Of Large Diesels in U. S.

HIGH costs of construction and of fuel oil have hampered the advance of the large Diesel-powered motorship in the United States as compared with Europe, John E. Burkhardt, chief engineer of the Bethlehem Shipbuilding Corporation, declared.

American businessmen, used to a larger return on invested capital than their European cousins, have hesitated at the higher first cost of the large Diesel.

In addition, the higher cost in United States ports of the type of oil required to fire the Diesel has been a factor tending to discourage their spread.

Science News Letter, July 2, 1938

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Inexpensive Summer Fun

Leaves Are Even Easier To Collect Than Flowers

(Third of a series of 12 articles. Next week—Collecting Shells)

LEAVES are much easier to press and preserve than flowers. Most people who make a hobby of collecting botanical specimens tend to neglect leaves and concentrate on flowers, presumably because they are brighter and generally more attractive than "just leaves." But making a collection of leaves of the trees and shrubs in your neighborhood has its advantages, too.

The same kind of plant press that is used for flowers, with newspaper folders and sheets of blotting paper, will serve excellently for pressing leaves. Indeed, for most leaves even the primitive book or thick magazine or mail-order catalog will do well enough.

For larger, juicier leaves, however, pressing between sheets of blotting paper is desirable. A recent improvement, for use with the leaves of water-lily and other water plants, is to warm the blotters in an oven before using, as you would dinner plates. This dries the leaves out more quickly and partly eliminates their tendency to blacken or become moldy.

Of course, you will limit your ambitions to the size of your folders and press. That means you can't press the very largest leaves that grow in this part of the world, like those of burdock and rhubarb, or the highly complex leaves of the Kentucky coffee tree and Hercules' club. Fortunately, however, few plants outside the tropics have leaves larger than a half-page of a newspaper.

It is a good idea to collect several leaves—say, as many as will go into a folder—from each tree you select as a specimen-source. That will enable you to study the differences between leaves from the same tree. Pick leaves from all sides, and from the top as well, if possible.

It is interesting, also, to collect leaves from trees of the same species standing side by side. Often there will be marked differences between such near neighbors; trees have individualities of their own, just like human beings.

When you are collecting specimens from trees or shrubs with very small leaves, it will usually be desirable to take whole twigs instead of individual leaves. This is particularly the case for evergreen trees like pines and larches. Some of these are difficult to handle, but the twigs of some evergreens, like the arborvitae or white cedar, are flat—they come "already pressed."

For pressed plant specimens of all kinds you should make systematic labels that give full information for future reference. First, there should be a space left for the name of the plant, when you have learned it. Then your own name, as collector, with date of collection. Then the locality, and finally a brief note about soil, moisture conditions, etc. Thus:

BUR OAK
Coll. by Will Smith, Jr.
July 5, 1938.
Jones' Grove, 3 mi. W.
of Homeville, Ohio.
Dry, gravelly hillside,
North slope; open woods.

Science News Letter, July 2, 1938

• Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

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Please send me **Bulletin 3,** containing additional information about collecting leaves and your list of books and leaflets on the subject.

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PHYSICS

New Hope of Harnessing Sun's Prodigious Energy

THE SCIENTIFIC dream of converting the sunshine cheaply into some form of practical power, such as electricity, is an enticing idea which is undoubtedly closer to realization than the release of the supposed power within the atom.

The earth's imports of solar energy are about all that it receives from outer space that is of any consequence. Immense quantities of energy are received. During the three months of greatest sunshine in the temperate zone, an acre of land receives directly from the sun an amount of heat equivalent to the burning of approximately 250 tons of high-grade coal.

Only a minute portion of this energy is captured and converted by plants growing on the land—some two- or three-tenths of one per cent.

Our modern industrial civilization is possible only because inefficiently, but in impressive quantity, the past ages stored up sunshine in coal, oil and gas.

The search for more efficient solar energy utilization is being energized by Dr. Godfrey Lowell Cabot's gift to the Massachusetts Institute of Technology. Professors and students will be spreading a reasearch net for new facts and applications.

A Triple Program

The program has three directions: 1. Means for utilizing solar heat to operate engines to deliver mechanical power. 2. The possibility of converting solar radiation into electrical energy. 3. Chemical conversion of sunlight into forms available for work.

Mirrors might concentrate the sunshine and feed it to engines operating on small temperature range at low upper temperature, with small first cost and low maintenance.

Hope for electricity directly from sunlight lies in improving the low efficiency of vacuum or gas-filled photoelectric cells, thermopiles and boundary-layer apparatus, such as the copper-copper oxide cell.

There is possibility of eventually discovering chemical compounds that can absorb sunshine and convert it economically into stored energy.

Science News Letter, July 2, 1938

Boulder Lake sends to the Colorado River water cold and clear enough to suit rainbow trout.

PSYCHIATRY

Famous Institution Holds Celebration After 30 Years

FEW scientific discoveries have the dramatic thrill for mankind that is possessed by certain epoch-making medical discoveries. The story of lives saved by insulin as a cure for diabetes, by liver for pernicious anemia, and, most recently, by insulin again as a cure for dementia precox have the heart-touching appeal of modern miracles.

Among these medical wonders is the tale of the conquest of paresis.

Paresis is particularly tragic because it attacks men in the prime of life, robbing them of health, happiness and sanity itself and leaving them to a slow horrible death. It was once called Officer's Disease because it would develop in those army men in the higher ranks who remained for a long time in the service. Enlisted men who left the army after their service was done, did not come under observation after the paresis had had time to develop.

First hint of the cure came also from the experience of the army. For it was observed that men returned from the tropics did not fall victims of this disease. It was at the Hospital for Mental Diseases in Vienna that Professor Wagner von Jauregg discovered that the tropical fever malaria would kill the organism responsible for paresis.

Recently the Vienna hospital celebrated its 30th anniversary—now as at its founding, one of the most modern institutions of its kind. Segregation of patients according to their condition, social rooms, theatres, and modern equipment and treatment make the outlook for the patient favorable. A special wing for alcoholic cases exclusively and a bureau for the supervision of alcoholic outpatients are innovations.

The Vienna hospital reviews an enviable past. What will the future hold?

Science News Letter, July 2, 1938

FOR SUMMER READING

THE AUTOBIOGRAPHY OF GENERAL ISAAC J. WISTAR

(1827-1905)

Wistar lived through remarkable times and made the most of them. He traveled across the continent with the vanguard of the Forty-Niners in a journey almost epic in itself. He earned and lost small fortunes as a miner, trapper, muleteer, speculator, and lawyer before he was thirty, such was his versatility.

He killed Indians relentlessly when menaced; yet he considered creation of an Indian empire to halt encroachment of white settlers on the "rightful owners" of the land. He never hesitated to pistol, club, or butt anyone who crossed him; yet the Governor of California singled him out to suppress the Vigilante rioters of 1856. He stood armed to fight Abolitionists and believed ardently in State rights; yet his privately-raised regiment is credited with saving the Union at Gettyburg and in the Seven Days Battles.

It is the last word from a leader of a vanished American generation.

Recent Reviews

"A really valuable adjunct to historical records. Narrated, vividly and honestly, one sees the story of the masses of the people, who developed this country and who saved it for the Union."

Boston Sunday Post.

"It is difficult to put the book down if once you start it."

Charles A. Kofoid,
Pony Express Courier, California.

"A Daring Biography. Did President Grant suggest that a prominent Philadelphian bribe him? That question, recalling the unsavory polities and scandals of the Grant Administration was posed openly for the first time with the publication of the late General Isaac J. Wistar's private memoirs."

Philadelphia Record.

"An epic backward glance and a long overdue epitaph to another and bolder people."

Fort Worth Star-Telegram.

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•First Glances at New Books

Natural History—Periodicals

THE CHICAGO NATURALIST, Vol. I., No. I—*Chicago Academy of Sciences,* quarterly, free to members of the Academy. A new periodical, designed as the official organ of the Chicago Academy of Sciences. Subjects of articles in the initial number range from herpetology to bryology; the lead article, by Donald Culross Peattie, tells of spring birds and their songs in the Chicago area.

Science News Letter, July 2, 1938

Pharmacy

ACONITE—Committee on Monographs, American Pharmaceutical Association—*American Pharmaceutical Association,* 259 p., illus., $2. First of a projected series on drugs and chemicals of pharmaceutical importance, in which treatment will be given to all aspects: botanical, chemical, pharmacognostical, pharmaceutical, pharmacological, bacteriological, and clinical. If the series is continued on the plane of this initial monograph, it will be invaluable to the profession.

Science News Letter, July 2, 1938

Botany

FLORA HAWAIIENSIS: THE NEW ILLUSTRATED FLORA OF THE HAWAIIAN ISLANDS—Otto Degener—*pub. by author, Honolulu,* Book 3, illus., $3. Systematic botanists and plant geographers will welcome this third part of Dr. Degner's pathbreaking work on Hawaiian flora.

Science News Letter, July 2, 1938

Paleontology

THE PLEISTOCENE VERTEBRATE FAUNA FROM CUMBERLAND CAVE, MARYLAND—James W. Gidley and C. Lewis Gazin—*Govt. Print. Off.,* 99 p., illus., 25 c. Begun by the late Dr. Gidley and completed by his successor, this monograph gives a fascinating picture of a cross-section of Pleistocene life, as recorded in the faunal population of one Maryland cavern.

Science News Letter, July 2, 1938

Botany

THE LONGEVITY OF PLANTS—Hans Molisch; Edmund H. Fulling, trans.—*Pub. by the Translator,* 226 p., $3. See p. 13.

Science News Letter, July 2, 1938

Physics

COMBUSTION, FLAMES AND EXPLOSIONS OF GASES—Bernard Lewis and Guenther Von Elbe—*Cambridge (Macmillan),* 415 p., illus., $5.50. Here is the scientific treatment of combustion, either useful in control of power or dangerous in mine explosions, which supplies the background for a wide variety of everyday happenings. The authors are two experts from the Bureau of Mines and Carnegie Institute of Technology.

Science News Letter, July 2, 1938

Geography

NORTHERNMOST LABRADOR MAPPED FROM THE AIR—Alexander Forbes—*American Geographical Society,* 255 p., illus., navigational notes and maps in separate holder, $4. Without the new technique of aerial photographic mapping, northern Labrador would probably have remained a *terra incognita* for centuries, it is such an inaccessible and forbidding land. Now we can have accurate knowledge of the topography of this land, even of hundreds of square miles of it where no white man has ever set foot. The text tells of the work of the various expeditions, and the excellent halftone illustrations give a good idea of the general character of the country.

Science News Letter, July 2, 1938

Botany

STUDIES OF THE AMERICAN FLORA—I—Julian A. Steyermark—*Field Museum,* 34 p., illus., 40 c. This initial study in a series of taxonomic studies opens with a description of a new genus of Tiliaceae, *Mortoniodendron,* and describes also several species in other families.

Science News Letter, July 2, 1938

Photography

PICTURE MAKING WITH PAPER NEGATIVES—Nowell Ward—*Amer. Photo Pub.,* 88 p., illus., $1.25. A difficult and very effective technique is here explained clearly for the beginner. The beauty of the illustrations will make you want to try your own hand.

Science News Letter, July 2, 1938

Biology

ESSENTIALS OF BIOLOGY (new ed.)—W. H. D. Meier and Lois Meier Shoemaker—*Ginn,* 725 p., illus., $1.80.

Science News Letter, July 2, 1938

Biology

MANUAL FOR COMPARATIVE ANATOMY—Leonard P. Sayles—*Macmillan,* 214 loose-leaf pages, $1.60.

Science News Letter, July 2, 1938

Psychiatry

MAN AGAINST HIMSELF—Karl A. Menninger—*Harcourt, Brace,* 485 p., $3.75. See page 10.

Science News Letter, July 2, 1938

Physics

ON UNDERSTANDING PHYSICS—W. H. Watson—*Cambridge (Macmillan),* 146 p., $2.25. Every citizen will want to read this book of Prof. Watson's, which, he states, came about as a result of his own reflections while trying to clear up his own understanding of physics. The problems arising from recent developments in atomic physics are discussed, but the treatment is new, and different from that of mathematical physics.

Science News Letter, July 2, 1938

Chemistry

NUMERICAL PROBLEMS IN ADVANCED PHYSICAL CHEMISTRY—J. H. Wolfenden—*Oxford Univ. Press,* 229 p., $2.75. Here are 133 problems used at the University of Oxford to test candidates for their degree in physical chemistry. Each problem is stated quite completely and citations are given from the literature of chemistry which will provide clues to the solutions. Answers are given in the final pages of the book.

Science News Letter, July 2, 1938

Engineering

MOTORWAYS, FLYOVERS AND MOUNTAIN ROADS—F. G. Royal-Dawson—*Chem. Pub. Co. of N. Y.,* 176 p., $3.50. A book on roadway construction, designed, the author declares, to answer the engineer's "how should a road be laid out?" The scope of the volume includes a wide range of curvature, from the very large radii of motorways to the small minimum radii of horse-shoe and hairpin bends on mountain roads.

Science News Letter, July 2, 1938

Economics—Sociology

THE RIGHT TO WORK—Nels Anderson—*Modern Age,* 150 p., 50 c. The story of WPA and other work-creating agencies of the present administration. It will make you better acquainted with what these agencies are trying to accomplish, how they are being conducted, and whom they are benefiting.

Science News Letter, July 2, 1938

Biology

A LABORATORY MANUAL OF GENERAL BIOLOGY (2d ed.)—E. Grace White—*Mosby,* looseleaf, $1.75.

Science News Letter, July 2, 1938

Paleontology

FOSSIL SNAKES OF NORTH AMERICA—Charles W. Gilmore—*Geological Soc. of America,* 96 p., illus., 75 c. See p. 4.

Science News Letter, July 2, 1938